

NEW ENGLAND NOTES:

DISTRIBUTION OF THREE RARE PLANTS ON ISLANDS IN MACHIAS BAY, MAINE

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A floristic survey of twelve islands in Machias Bay, Maine ($44^{\circ} 34' - 44^{\circ} 39'N$; $67^{\circ} 14' - 67^{\circ} 25'W$) was conducted during 1979, '80, and '82. All islands were visited twice a month during May through September of each year. Of the species found, *Iris Hookeri* Penny. (Beachead Iris), *Sedum Rosea* (L.) Scop. (Roseroot), and *Primula laurentiana* Fern. (Bird's-eye Primrose) are listed as being at the southern limit of their range and rare in New England (Gawler, 1981; Olday, 1982). The results of this survey indicate that the species have become established at previously undiscovered sites and have probably become extinct at some reported stations (Table 1).

Populations of *Iris Hookeri* were well established and reproductive on the islands. Individuals were usually found growing in clumps distributed throughout low grassland, in bare humus around rock outcrops, or on beach sand or gravel deposits above the intertidal zone. Populations of *Sedum Rosea* were generally vigorous, reproductive and comprised of numerous individuals growing on rock outcrops on the margins of the islands. There were usually no associated species growing with *Sedum*, a fact which can probably be attributed to the rigor of the wind-swept habitat it occupies, the salt spray it often receives, and the paucity of soil in the crevices where it roots. Drury (1980), in his discussion of plant rarity, noted that "the range of some species is restricted to isolated localities yet they occur in large numbers at each locality." *Sedum Rosea* and *Iris Hookeri* are two species which exhibit this type of distribution in Maine.

The most significant discovery on any of the islands sampled was the population of *Primula laurentiana* on North (Big) Scabby Island. The southern section of the island rises sharply to a 93' high dome and then falls off abruptly to an extended plateau which comprises approximately two-thirds of the island. *Primula laurentiana* grows profusely over an area about one hectare in size on the plateau. The average density in five randomly thrown quarter meter

quadrats was 18 plants/quadrat. The presence of pools and rock outcrops prohibits growth over the entire hectare, but a conservative estimate is that the population on this island contains over 100,000 individuals. Individuals in the population were vigorous and producing seed and vegetative offshoots. During July, 1982 numerous seedlings, as well as post-reproductive adults, were observed.

Another population of *Primula laurentiana*, composed of 23 individuals, was found on Ram Island in 1980. The plants were growing in sand and gravel-filled crevices around the edge of a brackish pool on the south-eastern side of the island. The island was not resurveyed until 1982. By then the population was extinct.

Although various hypotheses have been put forth to explain the distribution of *Primula laurentiana*, the question about controlling factors has not yet been resolved. Pike (1963) suggested that the species required an open habitat for survival and attributed its disappearance from Head Harbor Island to forest encroachment. The need for an open habitat is supported by the fact that the three islands in this study on which *P. laurentiana* occurred all lack forest cover. Pike (1963) also offered the opinion that the species distribution is controlled by a need for calcareous soil and cited the location of the plant near white-washed lighthouses as supporting evidence. No experimental test of this hypothesis has been conducted, however, and as Olday (1981) indicates, the plant occurs on six islands without lighthouses. Common habitat factors noted in this study were the restriction of *P. laurentiana* to areas whose surface was covered by fine stone fragments and which were generally lacking in organic matter and associated plant species. These observations suggest the alternative hypotheses that *P. laurentiana's* distribution may be controlled by a need for well-drained and aerated sites and/or by its inability to compete with other plant species.

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Table 1. Present distribution of *Iris Hookeri*, *Primula laurentiana*, and *Sedum Rosea* on islands in Machias Bay, Maine.

<i>Species</i>	<i>Confirmed at Historic Site</i>	<i>Years Since Discovery</i>	<i>Unconfirmed at Historic Site</i>	<i>Previously Undiscovered Site</i>
<i>Iris Hookeri</i>	North (Big) Libby (1960, G.) ^a	22		North (Inner) Double Headshot
	South (Little) Libby (1963, O.)	19		South (Outer) Double Headshot
	Ram (1980, O.)	2		Chance
	Scabby (no indica- tion whether on North or South Island) (1980, O.)	2		North (Big) Scabby South (Little) Scabby
<i>Primula laurentiana</i>	South Libby (1911, G.)	71	North Libby (1960, G.)	Ram ^b . North Scabby
<i>Sedum Rosea</i>	Old Man (1907, G.)	75		North Double Headshot
	Scabby (no indica- tion whether on North or South Island) (1980, O.)	2		North Scabby South Scabby
	Ram (1980, O.)	2		
	South Double Headshot (1980, O.)	2		
	North Libby (1907, G.)	75		
	South Libby (1907, G.)	75		
	Foster (1960, G.)	22		

^a Earliest published date of discovery, with investigator first listed by Gawler (G.), 1981 or Olday (O.), 1982.

^b Population first discovered in 1980. Extinct on island by 1982.

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